

STATEMENT OF COMMON OWNERSHIP

U.S. Patent No. 6,339,434 to West et al. and the present application, at the time of the invention of the present application, were commonly owned by Pixelworks, Inc.

REMARKS

The application includes claims 1-35 prior to entering this amendment.

The examiner rejects claims 8-13, 20-25, 29-31, and 35 under 35 U.S.C. § 103(a) as being unpatentable over Kobayashi in view of West et al. (U.S. Patent 6,339,434).

The examiner rejects claims 1-7, 14-19, 26-28, and 32-34 under 35 U.S.C. § 102(b) as being anticipated by Kobayashi (U.S. Patent 6,056,408).

The applicants amend claims 1, 8-9, 14, 20-20, 26, and 29 and add claims 36-37.

The application remains with claims 1-37 after this amendment.

The applicants add no new matter and request reconsideration.

Claim Rejections Under § 103

The examiner rejects claims 8-13, 20-25, 29-31, and 35 as obvious over Kobayashi in view of West. West and the present application are commonly owned by Pixelworks. The applicants submit a Statement Of Common Ownership to disqualify West as prior art under 35 U.S.C. § 103(c).

The applicants rewrite claims 8-9, 20-21, and 29 in independent form including all of the limitations of the base and any intervening claims. Independent claims 8-9, 20-21, and 29, and their corresponding dependent claims 10-13, 22-25, and 30-31 are in condition for the examiner's allowance. The applicants have not amended claim 35 since the examiner rejected claim 35 as obvious over the combination of at least one disqualified reference (West).

Claim Rejections Under § 102

The examiner rejects claims 1-7, 14-19, 26-28, and 32-34 as being old over Kobayashi. The applicants traverse the rejection.

Kobayashi discloses projecting an image, detecting a deviation of the projected image from the projected surface, and correcting it. Kobayashi's figures 1 and 2 show an image pickup device 1, a screen 3 provided with a marker group 4, and a projected image 5 provided with a marker group 6.¹ The image pickup device 1 picks up the image of the projected image 5 along

¹ Kobayashi, column 5, lines 25-40

with its marker group 6, and screen 3 along with its marker group 4.² A deviation detecting means 12 extracts, from the image information on the marker groups 4 and 6, three elements of deviation or discrepancy between the projected image 5 and the screen 3, i.e., a positional deviation, a deviation in size, and an angle of torsion.³ Kobayashi corrects the deviations or discrepancies based on the detection.

In contrast, the present application discloses a method and apparatus for preventing keystone distortion. The present application relies on a user selecting or otherwise indicating a plurality of parameters, e.g., image corners and center, of the desired (undistorted) image within a projected (distorted) image using a graphical user interface. A driver interprets the user's selected parameters to calculate horizontal and vertical rotation angles stored in scalar registers, in turn, used by a controller to predistort the image such that when projected, the predistorted image exhibits little to no keystone distortion. Kobayashi does not disclose such active selection of image parameters by a user using a graphical user interface.

The applicants amend claim 1 to recite *selecting a plurality of corners... using an input from a user through a graphical user interface*. Claims 14 and 26 include similar limitations. The examiner alleges that Kobayashi's interface 21 of figure 5 discloses the recited graphical user interface. The examiner, while rejecting claim 26, also alleges that the interface 21 allows a user to graphically identify a plurality of corners of an original image.⁴ The applicants disagree with the examiner's interpretation of Kobayashi's interface 21 as a graphical user interface. A graphical user interface is by its nature graphical, or more precisely "a type of environment that represents programs, files, and options by means of icons, menus, and dialog boxes on the screen. The user can select and activate these options by pointing and clicking with a mouse or, often, with the keyboard. A particular item (such as a scroll bar) works the same way to the user in all applications, because the graphical user interface provides standard software routines to handle these elements and report the user's actions (such as a mouse click on a particular icon or at a particular location in text, or a key press); applications call these routines with specific parameters rather than attempting to reproduce them from scratch."⁵

² Kobayashi, column 6, lines 16-19

³ Kobayashi, column 6, lines 25-30

⁴ Office action dated 10/23/2006, page 3, last paragraph

⁵ Microsoft® Bookshelf® Computer and Internet Dictionary© 1997 Microsoft Corporation. All rights reserved. Portions, Microsoft Press® Computer Dictionary, Third Edition. Copyright © 1997 by Microsoft Press. All rights reserved.

Nothing in Kobayashi disclose or suggest that the interface 21 allows a user to graphically select corners of an image, as recited. As best understood by the applicants, “information 22 obtained by the image pickup device 1 ... is sent to a personal computer 26 through an interface 21”.⁶ The interface 21 also receives additional-optical-system control signal 24 from the personal computer 26.⁷ The interface 21, however, does not remotely disclose a graphical user interface as recited by claims, even when the claims are given their broadest interpretation. Kobayashi fails to disclose that the interface 21 allows a user to graphically select a plurality of corner, as required by the recited limitation. That is, Kobayashi fails to disclose *selecting a plurality of corners ... using an input from a user through a graphical user interface*, as recited in claims 1, 14, and 26.

Claim 1 also recites *predistorting the original image to account for any keystone distortion responsive to the selecting....* Claims 14 and 26 include similar limitations. Keystone distortion has well defined meaning to those skilled in the art, and has been discussed in the background section of the application. A projected image distorts if the projection axis is not perpendicular to the projection surface; this distortion is termed keystone distortion (or keystoning) because the projected image will appear wider at the top than at the bottom.⁸ In contrast, Kobayashi detects and corrects three elements of deviation or discrepancy between a projected image and a screen, i.e., a positional deviation, a deviation in size, and an angle of torsion. Kobayashi’s positional deviation occurs when the projected image is not centered over the two-dimension projection surface. Kobayashi’s size deviation refers to the difference in size of the projected image and the projection surface. Kobayashi’s angle of torsion refers to “an angle formed by a two-dimensional vector determined by two specific points of the first marker group and a two-dimensional vector determined by two specific points of the second marker group corresponding to the specific points of the first marker group”, i.e., the angle of torsion is a measure of the rotational angle of the projected image with respect to the two-dimension projection surface.⁹ Kobayashi fails to disclose that any of these deviations is formed because the projection axis is not perpendicular to the projection surface, as required for keystone distortion to occur. To someone skilled in the art, it would be apparent that Kobayashi’s three

⁶ Kobayashi, column 9, lines 51-54

⁷ Kobayashi, column 9, lines 59-61

⁸ Present application, page 2, lines 5-8

⁹ Kobayashi, column 4, lines 11-15

deviational elements (i.e. position, size, and angle of torsion) are different from the keystone distortion correction disclosed in the present application. This can also be confirmed from Kobayashi's figures 8-11, which illustrate projected images with Kobayashi's deviational elements. None of the projected images in these figures appears to have wider top than bottom, as required by images exhibiting keystone distortion. Kobayashi's images appear to have same width on the top and bottom. That is, Kobayashi's projected images do not appear to exhibit keystone distortion and Kobayashi fails to disclose accounting for any keystone distortion, as required by claims 1, 14, and 26.

For at least these reason, independent claims 1, 14, and 26, and their corresponding dependent claims 2-7, 15-19, and 27-28 are in condition for the examiner's allowance.

New Claims

The applicants add new claims 36 and 37, support for which may be found throughout the specification.

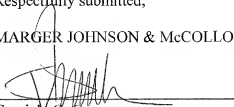
Conclusion

The applicants request reconsideration and allowance of all remaining claims. The applicants encourage the examiner to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

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Respectfully submitted,

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